REMARKS

Enclosed herewith is a Request for a Continued Prosecution Application under 37 CFR 1.53(d).

Enclosed herewith is a Petition to Exatend the term for response to July 30, 2001.

Enclosed herewith is a certified copy of French Patent Application No. 97 15639 filed 10 December 1997 in support of the priority claim under 35 USC §119.

Claims 1-15 and 17-20, all the claims pending in the application, are rejected and the written description is objected to under 35 USC §112, first paragraph, and 37 CFR 1.71(a)-(c); claims 1-18 are rejected under 35 USC §112, second paragraph; the objection to Figure 1 of the drawings is continued; the drawings are objected to under 37 CFR 1.83(a) with regard to the method steps of claims 1-15 and 17-20; and claims 1-15 and 17-20 are objected to as reciting informalities. No claim is allowed and no claim is rejected under 35 USC §§100-103.

The Office Action has been carefully considered.

The thoroughness with which the Examiner has reviewed the application is appreciated and Applicants will attempt to be as thorough in this response.

The Examiner has again objected to the drawings on the basis that Figure 1 is of poor quality making it impossible to distinguish as to which segments the indicia of 1-3 are labeling and which base points indicia 11-15 are labeling. With the previous amendment, Applicants have submitted the best drawing available. No newer drawings had been made since these drawings were accepted in the corresponding International Application filed under the Patent Cooperation Treaty..The Applicant requests that drawing requirement be deferred until allowable subject matter has found. The indicia 1-3 are defined as segments and accordingly, would be comparable in Figure 2, for example, to segments 24, 25 and 26. The triangle formed by these segments in Figure 2 would be the same triangle forming the flat triangular surface 4 referred to in page 4, line 8.

Indicia 11-15 are explained in page 4 of the present specification, lines 11-13. Thus, the upper point 11 would be the highest point of the object, the lower point 12 would be the lowest point of the object while point 13 is the extreme left point of the object, point 14 is the extreme right point. The front point 15 would be the extreme front point of the object and the back point is not visible in Figure 1. In other words, these extreme points would correspond for example to a plane that was tangent to the object or a great circle of the object at each of the noted extremities. Thus, if the object were a perfect sphere, it could be encased in a cube, with each of the six planes of the cube being tangential to a different extremity of the sphere.

Again, referring to Figure 2 of the present application, the contour 20 has an extreme left point, right point, top point and lower point which would be defined by lines tangent to these extreme elements. The points at which the tangent lines and the contour intersects would be comparable to the indicia 11-15.

It is hoped that this explanation is satisfactory for the Examiner's purposes. If not, and the Examiner indicates that the application is otherwise in condition for allowance, Applicants will attempt to provide a clearer drawing showing the information requested by the Examiner.

Attached to this amendment, is a marked copy of Figure 5 of the present application. In the first full paragraph of page 4 of the Examiner's Office Action, the Examiner questions the numbering of the lines. The Examiner is correct. The facet 40 of Figure 4 is defined by the points 42, 43, and 44 while the facet 41 is defined by the points 43, 44 and 45. In Figure 5 where a new rank point 47 is provided, it is evident that the facets labeled 40 and 41 in Figure 5 do not correspond to the similarly numbered facets in Figure 4. That is, the facet 40 in Figure 5 is defined by the points 42, 44 and 47 while the facet numbered 41 in Figure 5 is defined by the points of 43, 45 and 47. Accordingly, with the submitted drawing of Figure 5, these facet numbers have been changed to 40′ and 41′ respectively. This would indicate that facet 40′ has some commonality with facet 40, namely, the segment defined by points 42 and 44. Similarly, the facet 41′ has commonality with facet 41, namely, the segment defined by points 43 and 45.

It is hoped that these changes will be satisfactory for the Examiner's purposes. Changes have been made in page 6 of the specification to account for the change in numbering.

The Examiner has also objected to the drawings on the basis that they do not show every feature of the invention as specified in the claims. This position of the Examiner is most respectfully traversed.

Applicants submit that in fact all of the features of the steps of the method claims are in fact disclosed in the drawings and explained in the specification. Figures 2 and 3 are provided to provide a simplified version of the method incorporating the principles of the present invention since such method is easier to understand in the two-dimensional arrangement. The contour 20 in Figure 2 is shown to have a triangular facet defined by points 21, 22 and 23. Points 21, 22 and 23 are all on the contour. The three-dimensional equivalent would have the points all being on the periphery of the object. The Examiner should take into consideration that the operator carrying out this method has at his disposal a plurality of images which may be sections taken through the object at several different positions so that all the information concerning the contour of each intersection of the plane with the object is provided.

One such contour is shown in Figures 2 and 3, for example. The triangle defined by points 21, 22 and 23 clearly do not comprise the full area of the contour 20. In accordance with the disclosd embodiments of the method perpendiculars are taken to each of the three segments 24, 25 and 26, respectively. This is shown in Figure 3. The second rank points of Figure 3 are points 30, 31 and 32.

It can be seen that the total area encompassed by the segments 33-38 is much closer to the total area of the contour 20. Thus, as explained in the specification, page 4, line 21 to page 5, line 17, the additional points such as 29, 30 and 31 of Figure 3 are defined as the intersection of the perpendicular to the three segments of Figure 2 with the contour 20. New segments are formed, namely 33-38. If additional bisecting perpendiculars are taken with respect to these segments and further points defined at the

intersection of such perpendiculars with the contour, it can be seen that the area now provided will be much closer to the total area of the contour 20. As pointed out in the specification, page 4, line 25 to page 5, line 6 when the resultant increase in area becomes negligible there is no point in continuing to take perpendiculars to intersect the contour 20. At this point the total area of the contour would be achieved.

Applicants then explain the three-dimensional procedure with respect to Figure 4 and 5. Again, the Examiner should take into consideration that the operator carrying out this method has at his disposal a plurality of images which may be sections taken through the object at several different positions. The method can be performed for each or any of the plurality of images to achieve by iteration an acceptable approximation of volume in three-dimension. It is evident that the point 47 is another point on the surface of the object in the same manner as the points 29, 30 or 31 are further points on the contour 20 in Figure 3.

It is clear from Figure 5 that the total volume encompassed by the Figure 5 is greater than the volume of the three-dimensional figure in Figure 4. Thus, Figure 5 is closer to the total volume of the object. As additional points on the surface of the object are utilized and further facets develop in the same manner as the facets 40′, 41′, 48 and 49, the volume of the object will be more closely defined. When the total volume increase by using additional points on the object increases negligibly, the threshold value has been reached. At this point, the total volume of the object can be very closely determined.

In view of the above, it is respectfully submitted that the Applicants have explained carefully the method of estimating the volume of a three-dimensional object of the type having known a contour. It is believed that all of the steps of the claims now in the application are in fact clearly supported by the originally submitted specification. It is not believed that any new matter has been added with the changes in the specification.

The Examiner has rejected claims 1-15 and 17-20 because of varying informalities. With the above amendment to claim 1, it is believed that these informalities have been corrected.

The Examiner has rejected claims 1-15 and 17-20 as containing subject matter which is not described in the specification. The Examiner discusses claim 1 and questions how the utilization of the point 47 in Figure 5 gets any closer to the volume of the three-dimensional object. In the above discussion, it is explained how the area of the contour of Figure 2 an 3 is approached by the additional points taken on the contour. Also discussed, is the fact that the additional point 47 provides a greater volume than the volume of Figure 4. It should be clear that as additional points on the surface of the object are utilized, the new volumes will be closer and closer to the total volume of the object until the point is reached where the increase in volume by utilizing further points is negligible. At that point the volume of the object is determined.

The Examiner has rejected claims "1-18" under 35 USC §112 as being indefinite. Since claim 16 has been cancelled it is assumed that the Examiner was referring to claims 1-15, 17 and 18. The Examiner indicates that the claim language in claims 2 and 3 is indefinite since it is not clear how the volume of the object comprises images. Claims 2 and 3 have been amended to indicate that it is the contour of the object which is provided by the plurality of images. The Examiner questioned claim 15. This claim has been amended to indicate clearly that the given number referred to in Figure 1 is six. This should clear up any ambiguities to which the Examiner refers. Similarly, claim 17 has been amended to overcome the Examiner's objection.

Additional changes have been made in claims 7-13 to indicate that the second rank point is a function of the position of the first two adjacent facets. There does not

appear to be any antecedent for the "first two adjacent points". It is believed that these changes should be satisfactory for the Examiner 's purposes.

It is noted that the Examiner has not applied any prior art to the specific claims. It is believed that all of the informalities addressed by the Examiner have been taken care of and the issuance of a Notice of Allowability is in order. Such Notice is most respectfully solicited.

The Examiner is urged to telephone Applicant's attorney to further discuss the rejection if a Notice of Allowability is not forthcoming.

Respectfully submitted,

KNOPLIOCH ET AL

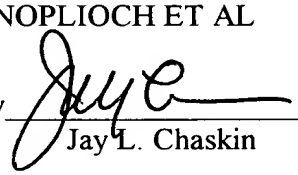
By 
Jay L. Chaskin

FIG.4

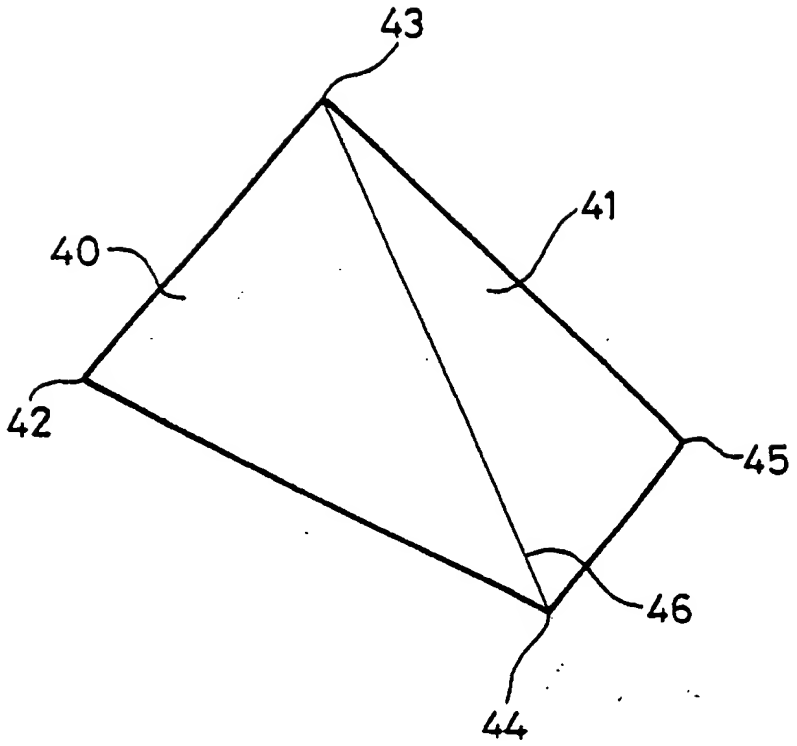


FIG.5